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# UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.

First Inventor or Application Identifier

KHAI HEE KWAN

Title

Method App and Prog for Pricing, Transferring, buying, selling and ...  
exercising of Freight Cargo Options on the vessel

Express Mail Label No.

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ \* Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)
2. ☒ Specification [Total Pages **43**]  
(preferred arrangement set forth below)
  - Descriptive title of the Invention
  - Cross References to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to Microfiche Appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
3. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets **8**]
4. ☒ Oath or Declaration [Total Pages **2**]
  - a. ☒ Newly executed (original or copy)
  - b. ☐ Copy from a prior application (37 C.F.R. § 1.63(d))  
(for continuation/divisional with Box 16 completed)
    - i. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

**NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).**

## ADDRESS TO:

Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

5. ☐ Microfiche Computer Program (Appendix)
6. ☐ Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)
  - a. ☐ Computer Readable Copy
  - b. ☐ Paper Copy (identical to computer copy)
  - c. ☐ Statement verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

7. ☐ Assignment Papers (cover sheet & document(s))
8. ☐ 37 C.F.R. § 3.73(b) Statement ☐ Power of Attorney  
(when there is an assignee)
9. ☐ English Translation Document (if applicable)
10. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
11. ☐ Preliminary Amendment
12. ☐ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
13. ☒ \* Small Entity Statement(s) ☐ Statement filed in prior application, Status still proper and desired (PTO/SB/09-12)
14. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)
15. ☐ Other: .....

## 16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP)

of prior application No: \_\_\_\_\_ / \_\_\_\_\_

Prior application information: Examiner \_\_\_\_\_

Group / Art Unit: \_\_\_\_\_

**For CONTINUATION or DIVISIONAL APPS only:** The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

## 17. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label

(Insert Customer No. or Attach bar code label here)

or ☒ Correspondence address below

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Name (Print/Type)

KHAI HEE KWAN

Registration No. (Attorney/Agent)

Signature

*[Signature]*

Date

10.8.99

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USA

Attached with this Documents are listed below. Please verify and return same to the above address.

The application number (not known)  
The filing date of the application (not known)

**The title of the invention :** Method, apparatus and program for pricing, transferring, buying, selling and exercising of freight cargo options on the World Wide Web

The name of the inventor : Khai Hee KWAN

**The title and number of pages of each PTO form**

**Check**

PTO/SB/05 1 page (1 original)

PTO/SB/17 1 page (2 copies/original and copy)

PTO/SB/01 2 pages (1 original)

PTO/SB/09 1 page (1 original)


**The number of pages of specification (excluding claims) : 28 pages**

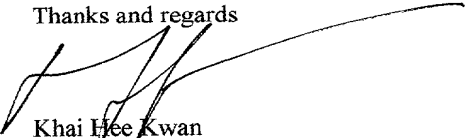
**The number of claims and the number of claims pages : 28 claims and 14 pages**

**The number of figures of drawing: 8 Figures**

**The number of sheets of drawing: 8 Sheets**


The amount of payment is USD 777 and the method of payment is by bank draft with details below. *Cheque No 742293 (NAB)*

Thanks and regards

  
Khai Hee Kwan  
10 Aug 1999

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**STATEMENT CLAIMING SMALL ENTITY STATUS  
(37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR**

Docket Number (Optional)

Applicant, Patentee, or Identifier: KHAI HEE KWAN

Application or Patent No.: \_\_\_\_\_

Filed or Issued: \_\_\_\_\_

Title: Method, Apparatus and Program for Pricing, transferring, buying, selling and exercising of Freight Cargo Options on the World Wide Web.

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

- ☒ the specification filed herewith with title as listed above.  
☐ the application identified above.  
☐ the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ No such person, concern, or organization exists.  
☐ Each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

KHAI HEE KWAN  
NAME OF INVENTOR

NAME OF INVENTOR

NAME OF INVENTOR

[Signature]  
Signature of inventor

Signature of inventor

Signature of inventor

10 Aug 1999  
Date


Date

Date

To whom it may concern,

I KHAI HEE KWAN, the inventor  
hereby declared that this is a true  
copy of the original.

Regards

  
11/8/99.

Name of Applicant: Khai Hee KWAN

Citizenship: Malaysian

Residence: P.O.Box 1178, Sandakan 90713, Sabah, Malaysia

**5 Title of Invention**

Method, apparatus and program for pricing, transferring, buying, selling and exercising of freight cargo options on the World Wide Web.

**Cross-reference to related Applications**

10 Not Applicable.

**Statement regarding federally sponsored research or development**

Not Applicable.

**15 Reference to a microfiche appendix**

Not Applicable.

**Technical Field**

20 This invention advantageously relates to a method, apparatus and program for pricing, transferring, buying, selling and exercising options for freight services using the World Wide Web interface.

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## Background of the Invention

The present invention relates to the field of originating, pricing,  
 transferring, buying, and selling of options for freight services on the Internet  
 5 using a web based interface in the form of an exchange model. Basically, the  
 exchange model, which primarily consists of the web interface, is installed at a  
 server which is then link to individual freight carriers' system that wish to  
 provide such a service. Freight fees, particularly in air-cargo are constantly  
 changing as well as rising, with availability subject to present economic  
 10 situation. Unfortunately at this time, there is neither system nor device for  
 managing the risk of these fees. There are also no exchanges that provide a  
 market for these options to be sold or bought or written if they should come into  
 existence. By using an option, one is guaranteed the exact remaining payment  
 when one wishes to exercise the option. Options contract for freight cargo has to  
 15 be standardised in terms of units, route and frequency although not perfectly  
 similar. The providers of freight services will also benefit since the need to  
 accurately forecast supply has diminished since the market participants are  
 deciding all the actual demand. Carriers will also be more informed and  
 profitable since option premium payments are up-front payments enhancing  
 20 cash flow where the clients decided not to exercise them.

Option contracts ("Option"), are known in other fields as a way of  
 locking in a particular purchasing price for a given commodity. Because of this,  
 options can be used by buyers to minimise the risk of rising prices and sellers

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for falling prices. One of the most widely known types of options is the covered option to purchase stocks or company securities. The issuer of this type of option owns a number of shares of a particular stock. The buyer of this type of option has the right to purchase from the issuer of the options, a predetermined  
 5 number of shares of the stock, at a predetermined price, at any time before the option expires. This “style” is usually called the American Option while the European Option means, the buyer can only exercise at a fixed date as set out in the terms of sale of the option.

As explained earlier, there has been no acceptable way of minimising the  
 10 risk of fluctuations in freight services cost and as far as I am aware, options to purchase or pay for freight facilities have never been sold or traded any where in the world. Moreover no system has been developed for determining prices for options for freight facilities and keeping track of the sale and exercise of these options. The current system uses a combination of hurdle rates, bid rate and cut-  
 15 off price which has to be determined by the manager. Different rates are used to manage different ‘desperation’ points as the time approach for the carrier to depart.

## Brief Summary of the Invention

It is an object of this invention to provide an innovative way to manage freight fees by providing the method, apparatus and program for pricing, buying, selling  
5 and exercising options to pay for freight cargo facilities. This invention details the framework to cover four sectors, freight for space, air, rail and sea transports.

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## Description of Invention

The Inventor has developed a method of utilising a telecommunications service system host computer connecting to various terminal system including Automatic Teller Machines (ATM) which is linked to a public telephony system network or through the Internet where applicable. The design is a modular web-based application that utilises the HTTP protocol that has been serving the Internet community since the emergence of the first websites. It is a 3-tier architecture and a very thin client that makes maintenance easy. The three layers are the Microsoft SQL Server 7.0 as the database server, a set of ActiveX components powered by the Microsoft Internet Information Server 4.0 and hosted by an NT Server 4.0 at the middle tier, and clients using web browsers at the front end. The combination of these is a secure, reliable and easy to maintain system in which a client/customers only needs a web browser and intranet/Internet connection to access the system. In addition, the HTTPS protocol could be used to support secure transactions. Implemented within an organisation, users can connect to the system using a computer in the same network or using a telephone line through the Dial-up connection, both using the TCP/IP protocol. Connected to the Internet, a user can reach the system from anywhere in the world.

Thus according to one embodiment of the invention there is provided,

a process system comprising:

- 5 receiving an incoming request from a terminal through the public telephony system network via a modem or through the Internet or any connecting interface suitable for this purpose,

authenticate the users,

10

respond with the appropriate welcoming message, inputting forms and wait for a response,

prompted the user with the information provided

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after inputting and registering the desired information, this will be then sent to the central controller for processing. The sending process is through a telephone line or through the Internet interfacing with a modem. The central controller will query responsive carrier's system, wait for their replies and will process the

20 information and sent a reply/response through the same way back to the user.

The above process is repeated again until the user is satisfied with his results.

The system is also able to process the option price for the freight services and rank results on its desirability. Stored all inputted data and maintain a database for all actions taken during its process and those instructed by the users, for example purchasing the option or selling it later. In line with the database  
5     concept, it can also do search, match, rank as well any secondary functions within its program.

The present invention means the possibility of a new way to manage freight costs, to lock in the cost of freight for clients, valuing the services using  
10    options and a means to execute using an external communicating devices such as a terminal. It will also provide carriers an opportunity to seek "risk adjusted" self-financing by reaching their potential clients at a reduced cost. For these clients, an opportunity to minimise but not eliminate the risk of freight services availability as well.

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## Brief Description of the Drawings

Figure 1. Depicts the overall system block diagram of a preferred embodiment of the present invention.

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Figure 2. Depicts the block diagram of the central controller

Figure 3. Depicts the block diagram of the agent terminal and Internet connections.

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Figure 4. Depicts the flow chart depicting initiations of a transaction in the agent terminal or through an Internet connection.

Figure 5. Depicts the flow chart depicting the operation of controller and the

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final phase of operation of agent terminal.

Figure 6. Depicts a flow chart depicting the operation of the when an option is exercised.

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Figure 7. Depicts a flow chart depicting the operation of an option being sold, marketed to be sold or match to be sold.

Figure 8. Depicts the WWW page interface format.

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## Description in detail of the preferred embodiments

The present invention is directed to a system to determining an appropriate price for options to purchase freight services and facilitating the sale and the

5 exercising of the options.

The traditional methods of determining prices for options on stocks and traditional commodities are not suited in the freight services market. To begin with (1) the services is only supplied by a limited of companies; (2) the product

10 is not completely fungible because certain potential users may prefer certain carriers because of loyalty programs or simple because the destination is not accessible by other carriers and (3) the supply of the product is small because only a limited number of placement/space are available on any given time (4) in examples such as space and air, such services is certainly limited by weight as

15 well as by size.

FIG 1 is an overall system block diagram of a preferred embodiment of the present invention. In this embodiment, central controller 20 is linked up to at least one freight agent ('agent') terminal 30 or registered user 30. This linked up

20 can also be through the Internet through the Internet Service Provider (ISP) Gateway 6 or a network system whichever is preferable by the seller/provider at that time depending on economic costs of the system. Two terminals depicted in FIG 1 but any number of agent/users terminals can be used including those

linked via the Internet 5. The link between the terminal 30 and the central controller 20 does not have to be a physical link, it can, for example be a link via a modem, as described in the subsequent description, or any other telecommunication link including wireless systems. An option transaction can be initiated from any one of the agent/users terminals 30. The information required to implement the transaction is passed until the transaction is complete. The central controller 20 keeps track of all transactions including transactions in the system. Upon receiving a request, it will query all the participating carriers' cargo system in 10 for their interest, which may be automatic or manually controlled. This system is designed mainly for air cargo facilities which is dependent on passengers loading as well hence it will also query the Flight Reservation System "A" at 11. "A" refers to an unique system for different carriers. It must be understood for periods such as one year in advance, both systems at 11 and 10 will probably not able to response hence greater dependence will be placed on other variables such as forecasting results from historical data which are found in both systems. The system depicted in FIG 1 may be embodied in hardware specially provided to implement the present invention. Alternatively, the system may be implemented using the infrastructure that already in existence such as using the ISP Gateway 6 interface.

FIG 2 is a block diagram of a preferred central controller 20. The central controller includes a CPU 21 which performs the processing functions of the

controller. It is also includes a read only memory 22 (ROM) and a random access memory 23 (RAM). The ROM 22 is used to store at least some of the program instructions that are executed by the CPU 21 such as portions of the operating system or BIOS and the RAM 23 is used for temporary storage of data. A clock circuit 24 provides a clock signal. The use of a CPU 21 is in conjunction with ROM and RAM and a clock circuit. The central controller 20 also includes a communication port 25 which enables the CPU 21 to communicate and query with devices external to the central controller 20. In particular the communication port 25 facilitates communication between the modem 26 and the CPU 21, so that information arriving from the modem 26 can be processed by the CPU 21 and the CPU 21 can send information to remote location via the modem 26. Modem 26 is mainly use to connect to the Internet to reach the Cargo system 10 and agents/users' terminals 30. The CPU 21 can also store information to and read information from, the data storage device 27. This data storage device 27 includes an option database 27a and a customer database 27b, which are described below. In addition, it includes transaction processor instruction 27c which can be read by and executed by the CPU 21, thereby enabling the CPU 21 to process transactions. While FIG 2 depicts separate option and customer databases, a single database that incorporates both of those functions may be used. This is described as mainly a Server environment.

FIG 3 is a block diagram of a preferred agent terminal or in recognition to the above, a client environment, which can be located at the freight agency or even at a private home, or any establishment having the authority to lend itself to this network. As discussed there can be a number of agent terminals 30 linked to the

5 one central controller 20 with each having the proper but different access authorities. Like the central controller describe above, the agent terminal 30 includes a CPU 31, ROM 32, RAM 33 and a clock circuit 34. The agent terminal 30 also include a communication port which interfaces with a modem 36 that facilitates communication between the agent terminal 30 and the central

10 controller 20. Of course instead of a modem 36 other communication devices can be used as shown above for the central controller 20. A standard computer such as an IBM PC, Apple Macintosh, running appropriate custom designed software may be used as the agent terminal.

15 The agent terminal 30 also includes an input device 40 to receive input from an operator. Any of a wide variety of input devices would be suitable including touch screen, mouse 41, keyboard 40. The input device 40 may interface directly with the CPU 31 as shown in the figure. Alternatively an appropriate interface circuit may be placed between the CPU 31 and the input device 40.

20 The agent terminal 30 also includes a video monitor 39 for conveying information to the operator/user. The most preferred video monitor 39 is a LCD, LED and thin film transistor panels. A video driver 38 interfaces the CPU 31 to the video monitor 39 (or to any other type of video display device). The agent

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terminal 30 also includes a data storage device 37 in which transaction processor instructions 37a are stored. These instructions can be read by and executed by the CPU 31 thereby enabling the CPU 31 to process transactions.

- 5 FIG 4 is a flow chart depicting the initiation of a transaction-using agent terminal 30. The steps of the process shown in FIG 4 may be implemented in a computer program that may be installed at the agent terminal alternatively as said, the terminal at the user level is merely a “dummy” console having access to the server at Central Controller 20. In fact, the computer program which is
- 10 basically an query interface between User 30 and Cargo system 10 be installed at the Central Controller 20 from a computer readable medium and then stored therein in one or more of the ROM memory 22, RAM memory 23 and data storage device 27 for access and use by agent terminals with authority as required. The program described here is to enable an option price to be
- 15 calculated. It is important to consider that the significance here is not just in presenting an option price to the user but to allow this price which is attached to a air-cargo facility to be freely traded in an exchange environment. In short, the user may purchase this option and do nothing, purchase and again offer it for sale in the same system to others, purchase and exercise it later.
- 20 The process starts when a customer contacts a carrier provider such as the Singapore Airlines or its agent in step S1. Alternatively, a registered user can access it through the ISP Gateway 6 by using browser program by applying the command <http://www.optionsys.com> which will get connected to the central

controller 20 (provided at that time the central controller 20 is connected to the ISP Gateway 6 as well) and where possible mirror sites are available for faster access. The customer selects the course information in step S2. This information comprises mainly of two components: the date of departure and route criteria.

- 5 The date of departure criteria defines the time when the route is scheduled to begin. The route criteria refers to the actual route the customer is seeking to reach say from Sydney to Singapore, non-stop, plane type, size and weight, time of arrival, urgency, once a day etc. Such requirements may be different from carriers to carriers and indeed from customers to customers. The route
  - 10 information is entered by either the customer or by an agent, into the agent terminal 30 in step S3. Customer data such as the customer's name, address, and telephone number, handle if any, may also be entered into the agent terminal 30 in step S3. The route information and the customer data are then transmitted to the central controller 20 in step S4. The Central Controller 20 upon receiving
  - 15 this information will sent a simultaneous request to Cargo System 10.
- S4 also includes the step where corresponding information matching the criterion by customer/user data are requested from Cargo System 10 and are received.

- 20 Returning to FIG 3, each of the steps S1-S4 described above are executed by the CPU 31 which is executing transaction processor instructions 37a stored in data storage device 37. The communication with the central controller 20 takes place

via the communication port 35 and modem 36 or as the case may be, with Internet 5 through ISP Gateway Interface 6.

FIG 5 is a flow chart of the operation of the central controller 20 after receiving  
5 of route information from the agent/user terminal 30 and corresponding  
information from carrier cargo system 10. The steps of the process shown in  
FIG 5 may be implemented in a computer program that may be installed in the  
central controller 20 from a computer readable medium and then stored therein  
in one or more of the ROM 22 , the RAM 23 and the data storage device 27  
10 (shown in FIG 2). The central controller 20 calculates the price of an option in  
step S10 based on the route information received from the agent terminal  
together with information from the option database 27a and data received from  
the Carrier cargo systems 10 including those linked to the Flight Reservation  
System 11. The point "A" refers to a particular Flight Reservation System.

15

When the route information includes similar routes being offered by the various  
carriers, the price of the option may be simply the lowest price from a set of  
individual options unless the customer specifically ask for the unique carrier. As  
the case may be, prior entities including users who have purchased options  
20 having indicated their willingness to sell a similar option at a price of their  
choice, this options and the selling price will be submitted and displayed to the  
user at the same time. All options offered should be covered.

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Expanding the case for **air cargo**, the calculation of the option price may be determined by multiplying a series of factors as refined from time to time which will affect the value of the options. The main deciding factor is the loading capacity (LC) of the chosen carrier, which may be a fraction of the price for which the option is being purchased for example 18 percent. Generally the fraction will decrease as the service-route fees for which the option was purchased approaches the full price or near the expiring date. There are according to this invention many ways of calculating the value and as such these methods are only for demonstration purposes. In the final product, a combination of a few of the methods will be applied. In the final analysis, those most responsive will be adopted and refined while those which are not will be abandoned.

The following includes the main variables used.

15	LC	A base factor relating to loading capacity from passengers booking/reservation list for the scheduled flight. If the scheduled flight is more than a year, then check old records to compare with minimum based rate of 0.13	
		Adopt which ever is higher.	
20	Loading capacity of the carrier chosen for this contract	less than 1/3	0.18
		greater than 1/3 less than 1/2	0.40
		more than 1/2 less than 3/4	0.67
		more than 3/4 less than 5/6	0.78
		greater than 5/6	0.95
25	For LC more than 3/4, D will be 1.0		

D                    A factor relating to the number of weeks before departure. In this example D increases as the number of days increased

5

1 week	1.0
3 weeks	1.2
4 weeks	1.5
>4 weeks	1.8

10    For LC more than  $\frac{3}{4}$ , D will be 1.0

L                    A factor related to the expected cargo space on the subject route.

In this example, L increases as the expected demand increases, typically we

15    assume that route such as from London to New York has a higher demand than others.

High Demand	1.2
Medium	1.0
20    Low demand	0.7

C A factor relating to the loyalty of the customer. For example, a customer who has shown a track record in the past following some loyalty programs will be regarded as excellent, a customer who has no record of any dealings with this carrier at all will be considered a low status.

5	Excellent	0.7
	Good	0.8
	Average	0.9
	Pass	1.0
	Low	1.1

10

R A factor related to the flexibility of the customer's route plans. For example, a customer who is willing to consider other routes or a later flight is considered as flexible.

15

	Flexible	0.7
	Not Flexible	1.1

20

V                    A factor relating to the historical volatility of freight cost/fees. In this example, V increases as price volatility increase as measure in standard deviation terms or SD increases. This takes into account the seasonal high-lows.

5	Changing by more than 9 percent on a year to year basis	1.3
	Some Changes of up to 8 percent on a year to year basis	1.1
	Stable No Changes	0.8

W                    As per our space cargo example, launching of a space shuttle or  
 10    rocket can only be done during good weather and hence this plays into the equation as well. Hence the same way for any time of cargo schedule, weather is an important since flight cancellation means income lost.

	Forecasted good weather at date of departure	1.1
15	Forecasted normal weather at date of departure	1.0
	Forecasted bad weather at date of departure	0.9

T                    T signifies the timing. That is whether it is within school holiday or not. This is because if the period is during holiday, then in our air cargo example,  
 20    more people will be flying hence less space available in the cargo for non-passenger cargo. This however is a question of management policy and may be different with each carrier. Some may elect to put more flights knowing that there is greater demand and hence compensate the space availability.

T is assigned 1.2 for holidays

T is assigned 0.95 for other days

- 5 Q signifies the type of cargo being carried such as whether it is perishable or otherwise.

Q is assigned 1.2 for perishable

Q is assigned 0.95 for non-perishable

10

A signifies the plane type. For example, in a large aircraft such as a Jumbo, there is more room for cargo

A is assigned 0.9 for "Jumbo" types

- 15 A is assigned 1.0 for mid-range planes travelling short distance.

CO refers to the number of competition on the same route within the same time frame of 48 hours.

- 20 CO is assigned 0.86 when competitors amount to greater than 3

CO is assigned 0.92 when competition is less than 3



Using these variables, a suitable algorithm for calculating an appropriate option price is as follows:

Option Price for AIR-CARGO example =  $LC * D * L * C * R * V * W * T * Q * A * CO$

5

It should be mentioned that conditions and changes may be made to the above formula from time to time to reflect changes in the environment. Similarly, option pricing for space, land and sea cargo options will also be different since for example in space cargo, there is really no “passengers” yet so the factor T which refers to holiday or non-holiday period has no meaning. The above is only an example for demonstration purposely. More sophisticated and refined formula shall be used to arrive at a suitable option pricing model. Once the option price information has been calculated as shown above, it is transmitted to the customer in step S11 as per FIG 5

15

As an example, assume a customer wants to purchase an option for route Sydney to London base fee at USD 10,000 for 100 Kg (this standardisation should be the same for all contracts). Further assume that the particular flight as queried has passenger capacity (LC) of less than 1/3 hence (0.18) with departure date is 5 weeks from now (1.8), the route has a medium demand (L) of 1.0, he is a loyal customer (C) 0.7, he is not flexible (R) 1.1, the service fees standard deviation is stable (V) 0.8, weather is forecast to be normal (W) 1.0 and timing is not within the holiday session (T) 0.95. The cargo is non-perishable (0.95) ,

20

the type of plane is a Jumbo (0.9) and there is no competition (0.92). The base option price is USD 10,000 \*0.18 =USD 1800 and the final option price from one particular carrier is USD calculated as follows

$$5 \quad 1800 * 1.8 * 1.0 * 0.7 * 1.1 * 0.8 * 1 * 0.95 * 0.95 * 0.9 * 0.92 = \text{USD } 1491.43$$

After the price information is transmitted to the customer in step S11, the customer decides whether to purchase the option in step S12. If he decides to purchase the option, the system can process the sale by billing the customer's credit card/account in step S13. Of course, alternate methods of payment may be used instead of a credit card, including payment by cash, credit, check, debit card and the like each consistent with monetary value equivalent to the above, as long as it is before the departure date or expiring date of the option. If the customer decided not to purchase an option during step S12, the customer is given a chance to revise the route information in step S15 or exit or input his own bid S17 or scan other bid/offers S16. It is important to recognise that this is an option exchange where there are options being sold by other entities other than the carriers. However what is more important is to recognise that carriers being members of this exchange when called or queried to make market, these carriers shall oblige and hence only then an exchange can exist. Entities other than carrier members create liquidity in the exchange by taking various open positions. They are required to deposit a certain amount of margin before allowing to operate in this electronic exchange. Options are made transferable

so to ensure these values are properly priced. All information pertaining to the particular option is shown so other interested parties should be aware if there is any special peculiarity. By default all options contract should be standardised within the meaning that they are exchangeable within all participating carriers.

5 However, the business reality is that it can never be exactly the same. Carriers often try to distinguish this point in their service, for example. For the purpose of this exchange, the meaning shall take the form of a higher degree of tradability.

10 Furthermore, by manipulating the plans, the customer may be able to find an option that is suitably priced. He may also wish to put in his own bid S17 and let carriers that may be interested to make an offer or other options buyer may be interested to sell to him based on the above requirements S 16. The system is designed to be flexible so that there is liquidity in the market to allow

15 transactions to take place. He may also scan/search other offers by covered or non-covered option writers who are willing to sell a similar option if he is still not satisfied with what is available to him by the central controller 20. The credit card transaction may be carried out by the central controller 20 or by the agent terminal 30 with all records updated instantly. Transactions processed

20 through the agent terminal 30 may be carried out using the same modem 36 that is used to communicate with the central controller 20. Alternatively an additional modem (not shown here) may be included in the agent terminal 30 to process the credit card transactions. Alternative the normal credit merchant

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account may be used to facilitate the transaction. After the sale is completed, the option database (27a in FIG 2) is updated in step S14 to reflect the fact that a particular option has been sold. The number of cargo options sold for a particular carrier including or excluding passengers seats may be used by the system as a factor in determining the option price to be sold in the future, for example LC. More specifically, when the number of options outstanding for a given route rises, the price for subsequent purchase of similar options may be raised to compensate the carrier for the additional risk up to the point of the maximum capacity it can hold. In oversold position, carriers may have to purchase back these options to avoid adding another flight. Alternatively, clients may wish to purchase from another carriers or market sellers. In undersold positions, carriers may wish to purchase put options written by external parties. This is effectively a position where such parties are willing to pay only up to a certain price for such a service. For example a put position means selling a position to use a carrier services upon exercised by the carrier. Upon exercise of these put options, the writers/sellers have to purchase these contracts equivalent to the amount of KGs. For example, say the current rate is \$10,000 and the put seller is willing to sell one contract for 100 kg at \$2,000. The carrier upon buying it pays \$2000 to the put seller and upon exercise, the put seller will need to pay the remainder \$8000 instead of \$10,000 so effectively a discount of \$2000 was given.

The customer database (27b in FIG 2) may also be updated to indicate that a particular customer has purchased or sold a given option. This customer database may be used for various purposes including billing, messaging and marketing particularly using Internet based technology such as electronic mails  
 5 subject to authorisation by the customer.

FIG 6 is a block diagram depicting operation of the system when a customer exercises an option. The steps of this process may be stored on a computer readable medium, which in this case would be the data storage devices 27 and  
 10 37 (shown in FIGS 2 and 3). First, in step S20, the customer contacts the freight cargo agent and indicates that he wishes to exercise a previously purchase option. Alternatively, the registered user may try to access through the ISP Gateway 6 into the Internet 5 to link into the central controller 20. After the operator of the agent terminal 30 enters the information describing the option  
 15 and customer details, the agent terminal 30 transmits the option exercise information to central controller 20 in step S21. The central controller 20 then confirms that the option contract does in fact exist and is current (not expired) as shown in step S22. The central controller 20 also informs the cargo system 10 that this option is to be exercised and as such it is crystallised to a contractual  
 20 facility and hence obliged to complete its part of the contract by taking delivery of the cargo at the previously negotiated price. The customer's credit card is then billed for the facility specified by the option being exercised in step S23. The specifics of charging the customer for the route are similar to the specifics

of charging the original purchase of the option. The option database 27a in the central controller 20 (shown in FIG 2) is subsequently updated to show that the option has been exercised as shown in step S24.

5 FIG 7 is a block diagram depicting operation of the system when a customer wishes to sell an option. The steps of this process may be stored on a computer readable medium, which in this case would be the data storage devices 27 and 37 (shown in FIGS 2 and 3). First, in step S25, the customer contacts the freight agent and indicates that he wishes to sell a previously purchase option for the  
10 particular route. After the operator of the agent terminal 30 enters the information describing the option and customer details, the agent terminal 30 transmits the option information to central controller 20 in step S26. The central controller 20 then confirms that the option contract does in fact exist and is current (not expired) as shown in step S27. The information pertaining to the  
15 sell is displayed for all to see S 28. The central controller 20 will search the database 27a and match any ready bid for the option S 29. If there is a match, then it is sold and the seller be credited and buyer be billed S30. Option database will be modified to show the change of ownership and obligation S31  
otherwise unsold option will be stored until sold or expired whichever come  
20 first S30.

FIG 8 depicts the format of the World Wide Web interface format. With this availability, any qualified person may access the central controller 20 through the Internet 5 by using ISP Gateway 6. While it is freely available to the public,

as shown here, functional access is still very much controlled by central controller 20.

While the above description contemplates the creation, buy, sale, transfer of an  
 5 option with a fixed expiration date at a particular price, alternative pricing  
 configurations may also be used. After the respective carriers issue an option,  
 they can reserve space in the route covered by the option, and cancel the  
 reservation when the option expires without being exercised. For air-cargo, the  
 options shall expire 6 hours before the schedule departure so it gives time for  
 10 the carriers to make final adjustments.

Alternatively, they can do nothing until the option is exercised, and at that point  
 reserve the customer's requirements as per the contract made. If this result in  
 overbooking, then the carriers will need to re-arrange some of its schedule to  
 15 accommodate the contracted air cargo. The control is always with the provider  
 of these services since they are the sellers of these options. That is to say, they  
 can limit the remaining space for a particular route when it is near capacity by  
 raising the price of options. What is more satisfying here is to recognise the  
 option facility here is an hedge against rising cost of freight fees for users,  
 20 provide some market forces to determine its pricing, help to secure profits for  
 these providers and to plan for resources allocation.

### **Industrial Application**

This system according to the invention possesses several advantages over existing arrangements in reducing the cost of funding and improves the cargo intake in targeting the right users. It also attracts more audience by

5 providing incentives such as discounts (discount here refers to the cost of money over time) or at least by locking in the cost of freight services. This may not be so significant now but as the technology evolved, there will be opportunities for would be users to tailor all their requirements with the carriers' systems to give a complete service cycle. The increased network economy means such design

10 will enhance knowledge gathering including transparency and decision making for the carriers and their customer reducing any wastage and inefficient. Unlike traditional method of income for carriers which uses a deferred billing system, guesswork and inputs from sales dept, the up-front premium is an easier and less intrusive means of securing funds. It will also allow they to make a more

15 informed decision about the potential clients' interest and plan for their coming. Furthermore, this structure is much more cheaper and less administratively consuming. As this is an interactive and automated system with minimal human intervention, the users will always have control and can determine when they can buy/sell, how much to take and when to stop. There will be some form of

20 control within the system design to prevent abuse such as those found in the stock market. This invention is designed to be scaleable and without much mechanical moving parts will be robust.



## Claims

While the present invention has been described above in terms of specific embodiments, it is to be understood that the invention is not limited to the disclosed embodiments. The present invention is intended as an actionable framework for various modifications and equivalent structures included within the spirit and scope of the appended claims. In particular, similar design is noted for ship cargo, space cargo and rail cargo.

I, the inventor claims:

1. One data processing apparatus capable of linking to various carrier cargo systems and agents/users' terminal for determining a price of an freight service option, to offer for sell or trade and exercise of such option once created in an exchange environment where both buyers/sellers are electronically visible, having a pre-assigned user accounts, each comprising:

a central controller including a CPU and a memory operatively connected to said CPU;

at least one user terminal, adapted for communicating with said central controller, for transmitting to said controller determining option pricing

information including but not limited to the date of departure, flexibility, type of cargo and route criteria.

- at least one carrier cargo system terminal networked with flight passengers
- 5 reservation system, adapted for communicating with said central controller, for transmitting to said controller information including but not limited to the loading capacity of the schedule flight, demand rate, loyalty of the customer/option buyer, standard deviation of the freight price for this particular route, the weather forecast on this particular route on a particular date, the
- 10 coincidence of holiday period for date of departure, type of plane, number of competition on this route,

- Said memory in said central controller containing a program, adapted to be executed by said CPU, for calculating a price of an freight facility option to pay
- 15 for within a future period, for a particular route including but not limited to the loading capacity of the schedule flight, demand rate, loyalty of the customer/option buyer, standard deviation of the freight price for this particular route, the weather forecast on this particular route on a particular date, the coincidence of holiday period for date of departure, type of plane, number of
- 20 competition on this route, which satisfied the customer/buyer requirements,

Wherein said central controller receives said criteria/factors from said user/agents terminal and queries carrier cargo system based on part the factors

presented by user/agent, and carriers' respective reservation systems, receives real-time feedback and calculates the option price based upon the criteria/factors above as updated from time to time,

- 5 databases containing registered users account including past transaction records of any sale and purchase of options and terms, said accounts having protected passwords and login sequence,

- 10 databases containing searchable functions as well as viewable tables where options are posted for sale and bids are placed to attract sellers

2. The apparatus according to claim 1, wherein said program in said memory is adapted to receive a client request input via said user terminal to purchase or sell the option, search other options, offer for sale, offer to buy and further adapted  
15 to perform a credit card transaction to sell or buy the option for the client.

3. The apparatus according to claim 2, wherein said program in said memory is adapted to receive a directed customer request input via said user terminal to exercise an option and further adapted to perform a credit card transaction to  
20 sell to the customer in accordance with the terms of the option.

4. A method and process of determining a price of a freight cargo option for a fixed route using a central controller including a CPU and a memory operatively

connected to said CPU and containing a program adapted to be executed by said CPU for determining the price of the option, with at least a user terminal and a carrier cargo systems terminal networked to corresponding reservation system adapted for communicating with said CPU, the method comprising the steps of:

5

inputting the departure date, type of cargo, flexibility and route information criteria to the controller via the user terminal;

based on above input data by user, controller will query the cargo system for the  
 10 loading capacity of the scheduled flight as connected to the departure data and type of plane, its demand rate, check the loyalty of the particular user, calculates the standard deviation of the freight price for this particular route, query the forecasted weather on this particular route, check the coincidence of holiday period for date of departure, check the number of competition on this route and  
 15 return all this information to controller from the cargo system terminal;

Combining all the information from said user and carrier cargo systems, the central controller shall execute a program to calculate a price of a freight cargo option that gives the customer a right to pay for but not obligation within a  
 20 future said period equal or less to the period before the departure date, for a particular route which satisfied the route information and date of departure by having the CPU execute said program; and outputting the option price to the user terminal.

5. A data processing apparatus for determining the price of an option to pay for an air cargo freight service, comprising:

a CPU ; and

- 5 a memory operatively connected to said CPU, said memory containing a program adapted to be executed by said CPU and said CPU and memory co-operatively adapted to receive option pricing information inputs, and to calculate a price of the option to pay for within a future period, for a particular freight route, a cargo freight service satisfying the option pricing information
- 10 inputted by user and carrier cargo system.

6. The apparatus according to claim 5, wherein said program is adapted to receive option pricing information comprising the date of departure, type of cargo, flexibility and route information criteria from user, the loading capacity
- 15 of the schedule flight, demand rate, loyalty of the user, standard deviation of the freight price for this particular route, the forecasted weather on this particular route, the coincidence of holiday period for date of departure, and type of plane, and number of competition on this route from the cargo system;

- 20 7. The apparatus according to claims 5, wherein said program in said memory is adapted to receive at least one of first information describing a desired number of weeks before departure, second information concerning the expected demand on the route, and third information concerning the volatility of the freight prices,

and fourth the loyalty of the user, and fifth the flexibility of the user's route,  
 sixth the loading capacity of the plane at the time of query, seventh the predicted  
 weather prevailing on the date of departure, eighth the timing of the flight,  
 ninth the type of cargo, tenth the type of plane and eleventh the number of  
 5 competition and wherein said program is further adapted to use at least one of  
 said information, said second information, and said third information, said  
 fourth information, said fifth information, said sixth information, said seven  
 information, said eighth information, said ninth information, said tenth  
 information, said eleventh information to calculate the option price.

10 8. The apparatus according to claim 5 wherein said program in said memory is  
 adapted to receive an indication that a customer has purchase or sale the option  
 and further to update a database to reflect the sale or buying of the option.

9. The apparatus according to claim 5 wherein said the program in said memory  
 15 is adapted to calculate the option price based at least in part on the number of  
 similar options already sold or bought for a particular route and carrier using  
 information stored in an option database.

10. The apparatus according to claim 5, wherein the said program in said  
 20 memory is adapted to calculate to option price based at least in part on the  
 formula:

$$\text{Option price} = LC * D * L * C * R * V * W * T * Q * A * CO$$

5

11. A method of determining a price of the cargo option using a central controller including a CPU and a memory operatively connected to said CPU containing a program, adapted to be executed by said CPU for determining a price for the option, the method comprising the steps of :

inputting type of cargo and flexibility for this route criteria provided by a user or customer ;

20

this flight and with all these data, calculating the price of an option that gives the right to pay for but not the obligation within a future period for a particular route, a route satisfying the departure date and the criteria provided by the cargo systems by having the CPU execute said program; and outputting the option price,

12. A method of determining a price of the cargo option, comprising the steps of:

receiving option pricing information relative to future purchase for the particular route;

calculating the price for an option to pay for within a future period, for a particular route, satisfying the option pricing information above; and outputting the option price.

13. The method according to claim 12, wherein the step of receiving option pricing information includes receiving the date of departure and type of cargo and flexibility for this route criteria provided by a user or customer; querying the above data with a carrier cargo system to receive data on load capacity of a chosen plane, demand for this flight, check the loyalty of this customer,

calculate the standard deviation of cargo prices up to that time for this flight, check the possible weather on this departure date, check whether the departure date may coincidence with any public holiday or weekends, check the type of



plane available on this route and finally the number of competition for this route.

14. The method according to claim 12, further comprising of the steps of:

- 5 receiving at least one of first information describing a desired number of weeks before departure, second information concerning the expected demand on the route, and third information concerning the volatility of the freight prices, and fourth the loyalty of the customer, and fifth the flexibility of the customer's route, sixth the loading capacity of the plane, seventh the weather prevailing on
- 10 the date of departure, eighth the timing of the flight, ninth the type of cargo, tenth the type of plane and eleventh the number of competition and wherein said program is further adapted to use at least one of said information, said second information, and said third information, said fourth information, said fifth information, said sixth information, said seven information, said eight
- 15 information, said ninth information, said tenth information, said eleventh information to calculate the option price.

15. The method according to claim 12, further comprising the steps of receiving an indication that a customer has purchased the option or offer for sale this

- 20 option or put a bid for an option and updating a database to reflect any transaction affected with any the options by the carrier or with another seller.

16. The method according to claim 12, further comprising the step of receiving option sales information from an option database indicating a number of similar options that have been previously sold or written, and wherein the calculating steps uses the option sales information in determining the option price.

5

17. The method according to claim 12, further comprising the steps of receiving a customer request to purchase an option, receiving tender of the purchase from the customer, scanning for any available ready seller at that price or lower, performing a transaction to sell the option to the customer and storing

10 information regarding said option until expired or exercise whichever is first.

18. The method according to claim 17, further comprising the steps of receiving a customer request to exercise an option, performing a transaction to fully paid for the cargo service upon exercise to the customer in accordance with the terms of the option and modifying the database to reflect the full payment of the cargo service pursuant to the option.

15

19. The method according to claim 13, wherein the calculation of the option price is based in part upon pricing information that is satisfied by more than one

20 carrier cargo systems.

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20. The method according to claim 13, wherein the calculating steps of the option price is based in part upon the formula below.

$$\text{Option price} = LC * D * L * C * R * V * W * T * Q * A * CO$$

5

where LC is the load capacity times the base price for the option, D is a factor related to a desired number of weeks before departure date, L is a factor concerning the expected demand on the requested route, C is a factor concerning loyalty, R is a factor concerning flexibility, V is a factor concerning the volatility of the cargo freight prices, W is a factor concerning the weather on the departure date, T is a factor concerning timing of flight date such as in holiday period or otherwise, Q is factor for type of cargo, A is for type of plane and CO is for number of competition on the same route.

15 21. Computer executable process steps operative to control a computer, received input from user terminal and query cargo system terminal, stored all inputs on a computer readable medium for determining a price of an option to purchase or sell the right to buy an cargo service, display all open options both bid and offer quotations on-line comprising;

20 a step to receive departure date  
a step to assign the load capacity factor for a particular flight and to receive this factor at the controller,  
a step to receive a base price for the option on-line,

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a step to assign the expected demand factor on the requested route and to receive this factor at the controller,

a step to check the loyalty factor of the potential customer at the cargo system by scanning account records and to receive the loyalty factor of the potential

5 client at the controller,

a step to receive the flexibility factor at the controller as sent by the client at the user terminal,

a step to calculate the volatility of the cargo prices on real-time at the cargo system, link this to a factor and to receive this factor at the controller,

10 a step to assign a factor linking the predicted weather on the departure date and to receive this data at the controller,

a step to assign a factor linking the timing of the flight date such as in holiday period or otherwise at the cargo system and to receive this data at the controller,

a step to assign a factor as determine by the customer inputting the type of cargo

15 and to receive this factor at the controller,

a step to assign a factor as determine by the cargo system for the type of plane and to receive this factor at the controller,

a step to assign a factor as determine by the cargo system as to the number of competitors for this route and to receive this factor at the controller,

20 a step to output the option price,

and step to ask the customer to accept or reject or change input criteria.

22. A method of pricing an option to pay for a cargo freight route, comprising the steps of :

inquiring on a cargo freight price for a particular route;

receiving said cargo freight price;

- 5 receiving an offer to pay for a given price an option to pay for within a particular period, for a particular route, the freight services and purchasing said option at option price.

- 10 23. The method according to claim 22, further including the steps of using said option to pay for the freight cargo service.

- 15 24. The method according to claim 22, wherein said step of inquiring on an cargo flight route includes providing information including the date of departure, flexibility, type of cargo, name of user and route criteria.

25. A data processing apparatus for originating, bidding, offering, selling an option to pay for a cargo service, comprising:  
a user terminal adapted to communicate with a central controller,  
said central controller adapted to communicate with various carrier cargo system  
20 and to receive their data based on the first communication from the user terminal and to calculate a price of an option to pay for freight cargo services within a future period, for a particular route.

Said user terminal adapted to transmit to the central controller option pricing information comprising the date of departure, flexibility, type of cargo and name, linking together with carrier cargo systems terminal adapted to transmit to central controller option pricing information such as load capacity, demand, 5 loyalty, volatility of cargo prices, weather, type of plane and number of competition and further adapted to receive from the central controller a price of an option satisfying all these factors.

26. The apparatus according to claim 25, wherein said terminal is adapted to 10 transmit a customer request to purchase the option and further adapted to perform a credit card transaction to sell the option to the customer.

27. The apparatus according to claim 26, wherein said terminal is adapted to transmit a customer request to exercise an option and further adapted to perform 15 a credit card transaction to fully pay for the freight cargo service to the customer in accordance to the terms of the option.

28. The apparatus according to claim 26, wherein said terminal is adapted to transmit a seller (non-carrier) request to sell a pre-owned option and further 20 adapted to perform a credit card transaction to credit the payment from the sell of the option to the seller/customer and debit the payment from the buyer while updating all entries and claims immediately.

**Exchange Mechanism to facilitate the pricing and trading of Cargo Freight  
Option Facility on the Internet.**

5

**Abstract**

An apparatus, method and program for determining the price of an option to pay for or sell cargo freight facility on the Internet and for facilitating the sale and exercise of those options including the underlying contract which is made transferable. By purchasing an option, a customer can lock in a specified freight cost without tying up his money and without risking the higher cost fee if there is a rise later. Pricing of these options may be based on several criterion including, date of departure, type of cargo and so on. By selling such option, the carriers will have extra cash flow and reliability.

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660700" T8E9E60

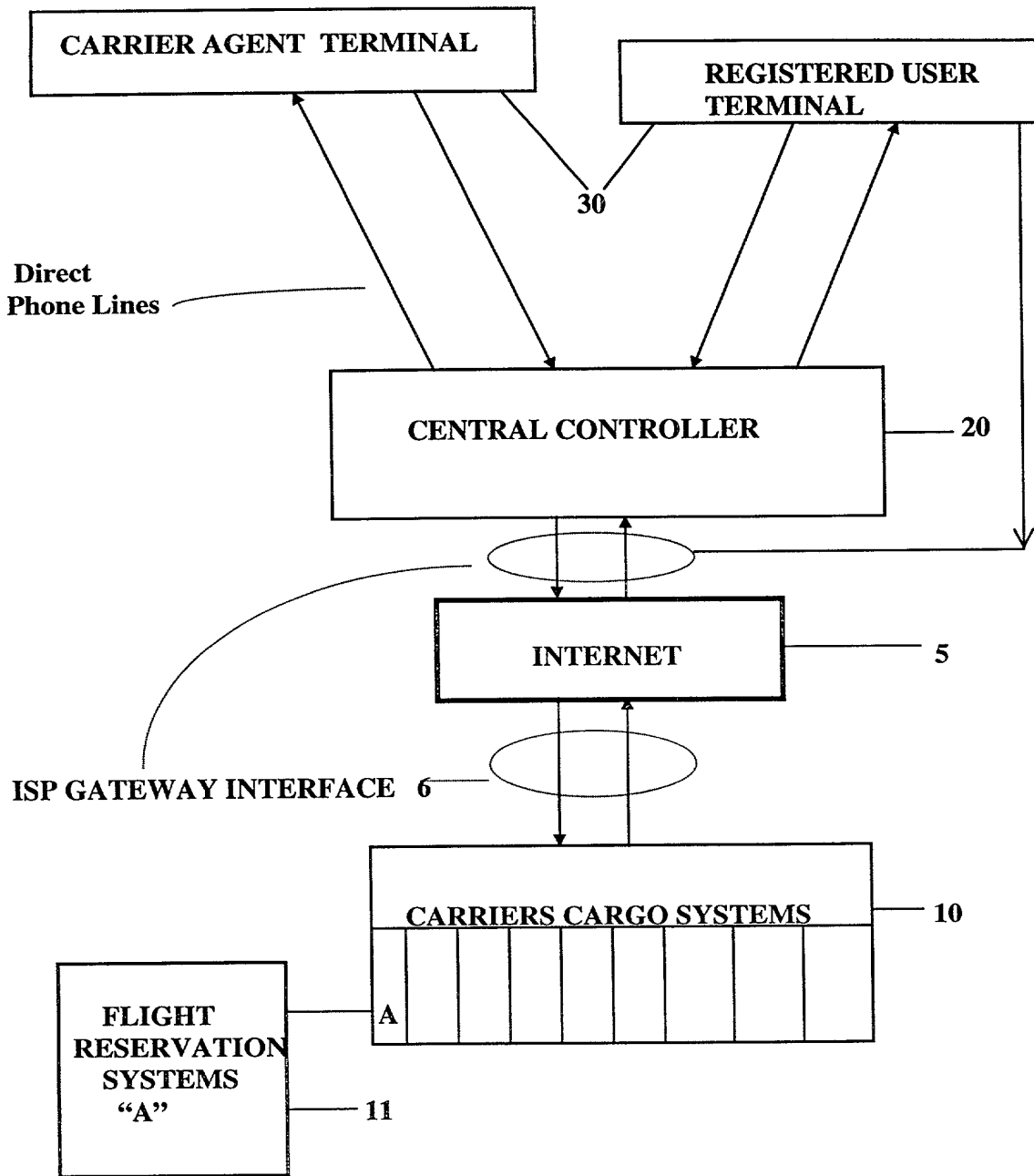


FIG . 1



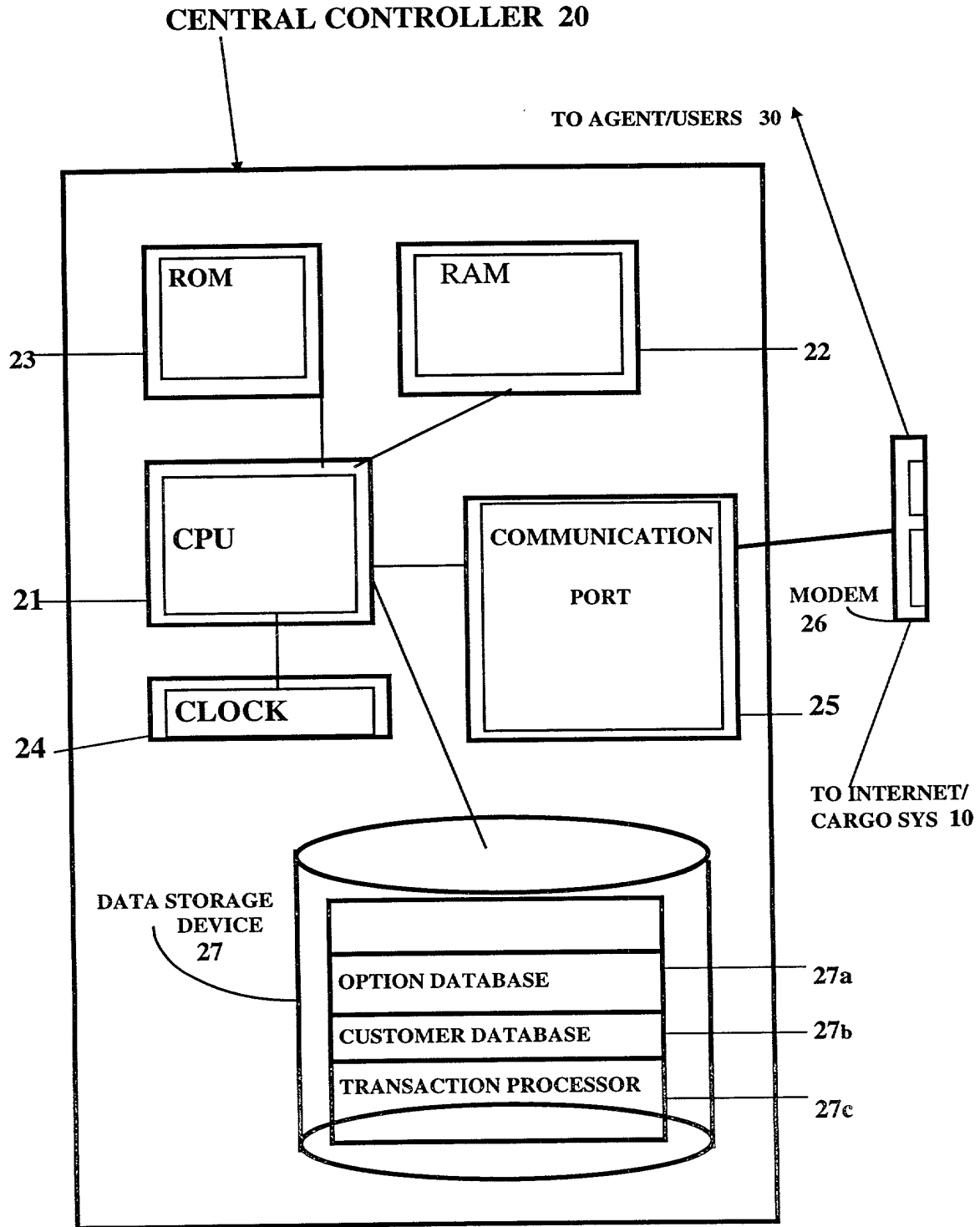


FIG. 2

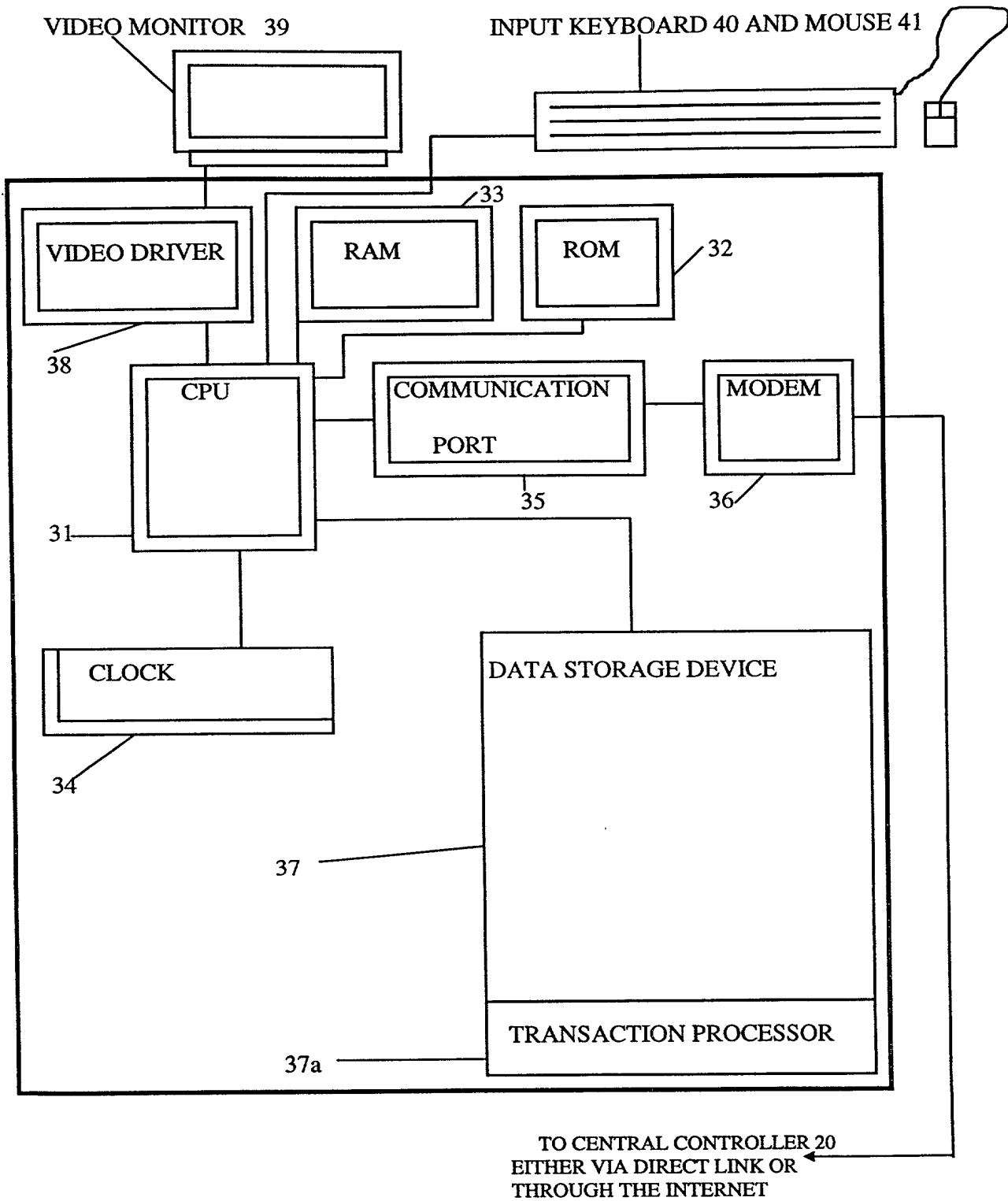


FIG. 3

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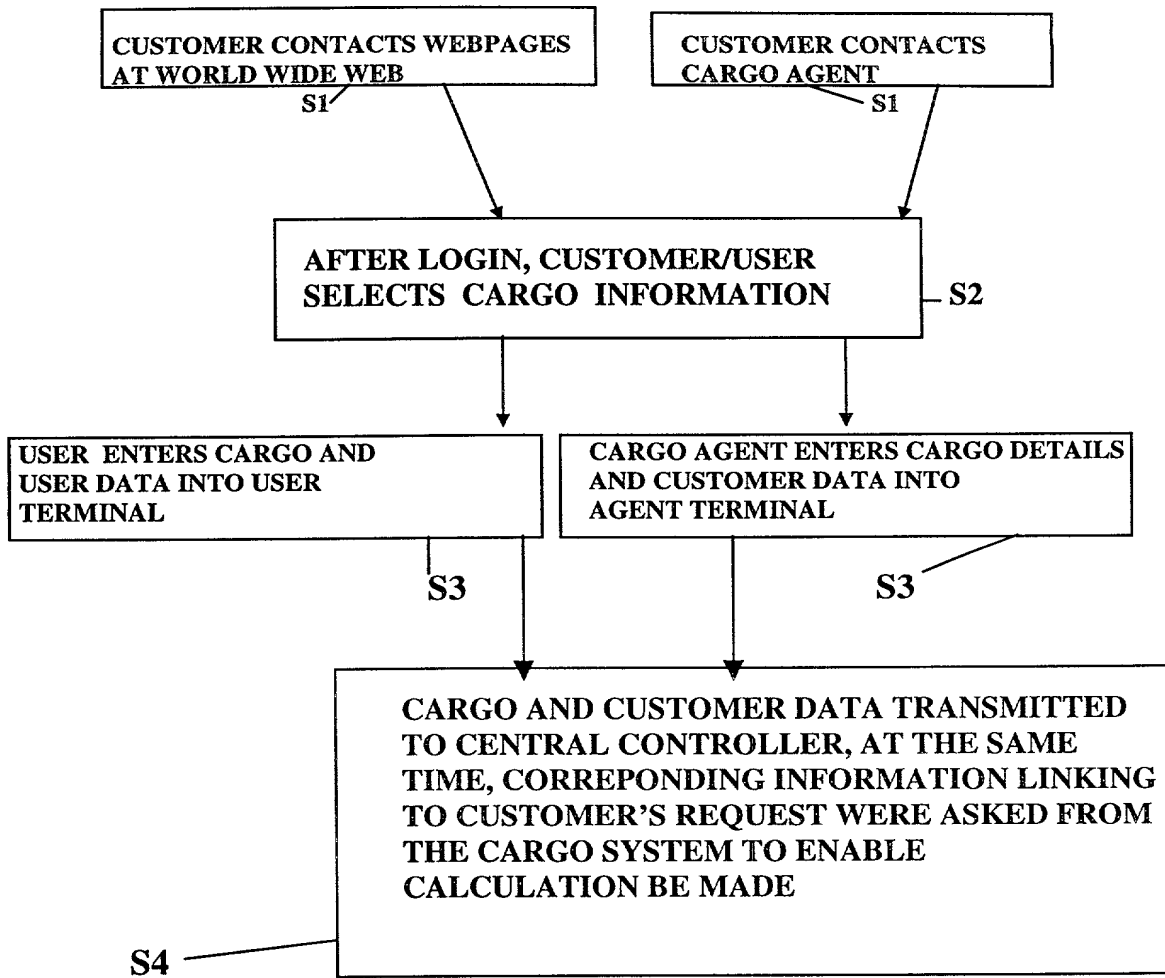


FIG. 4

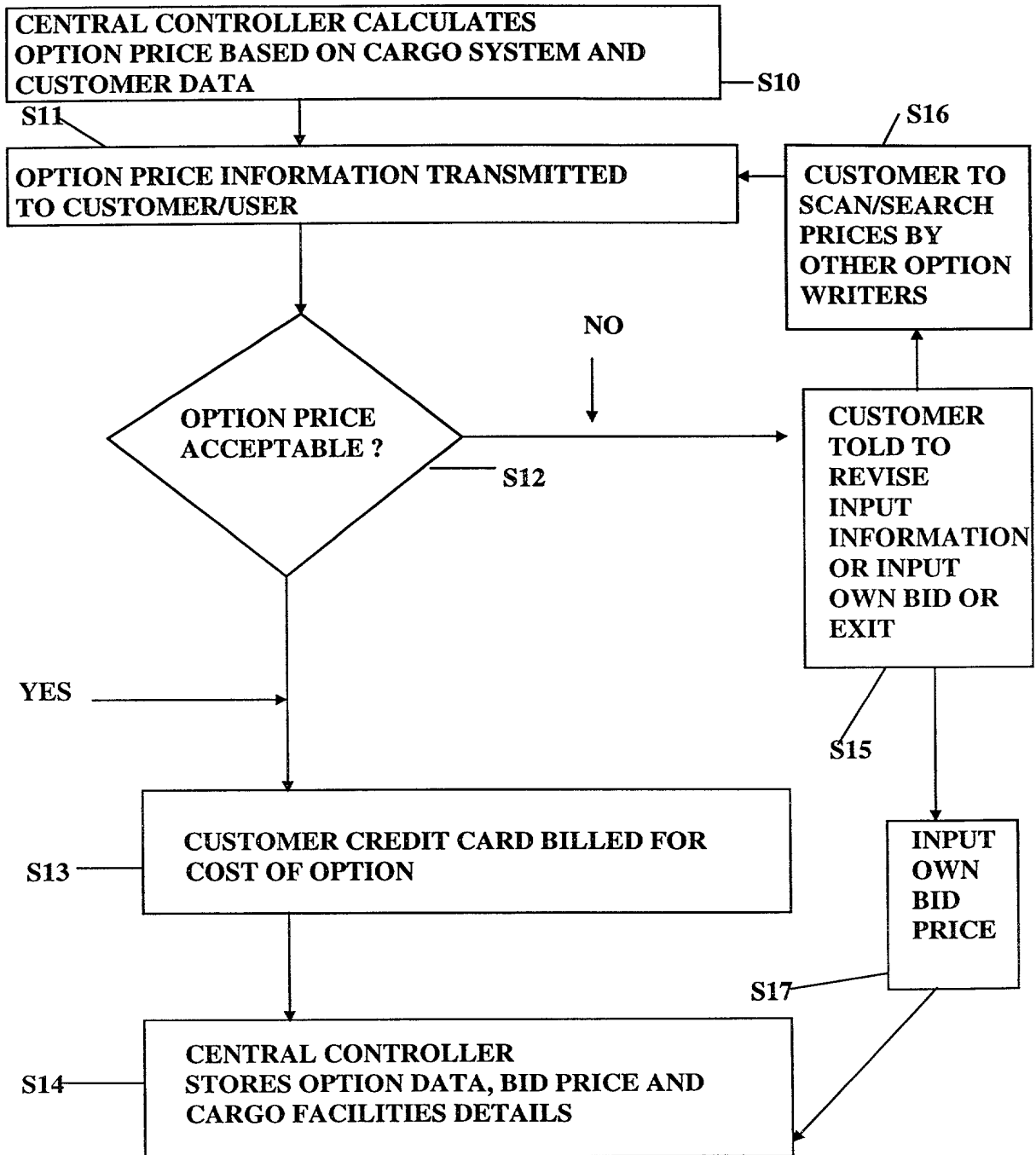


FIG . 5

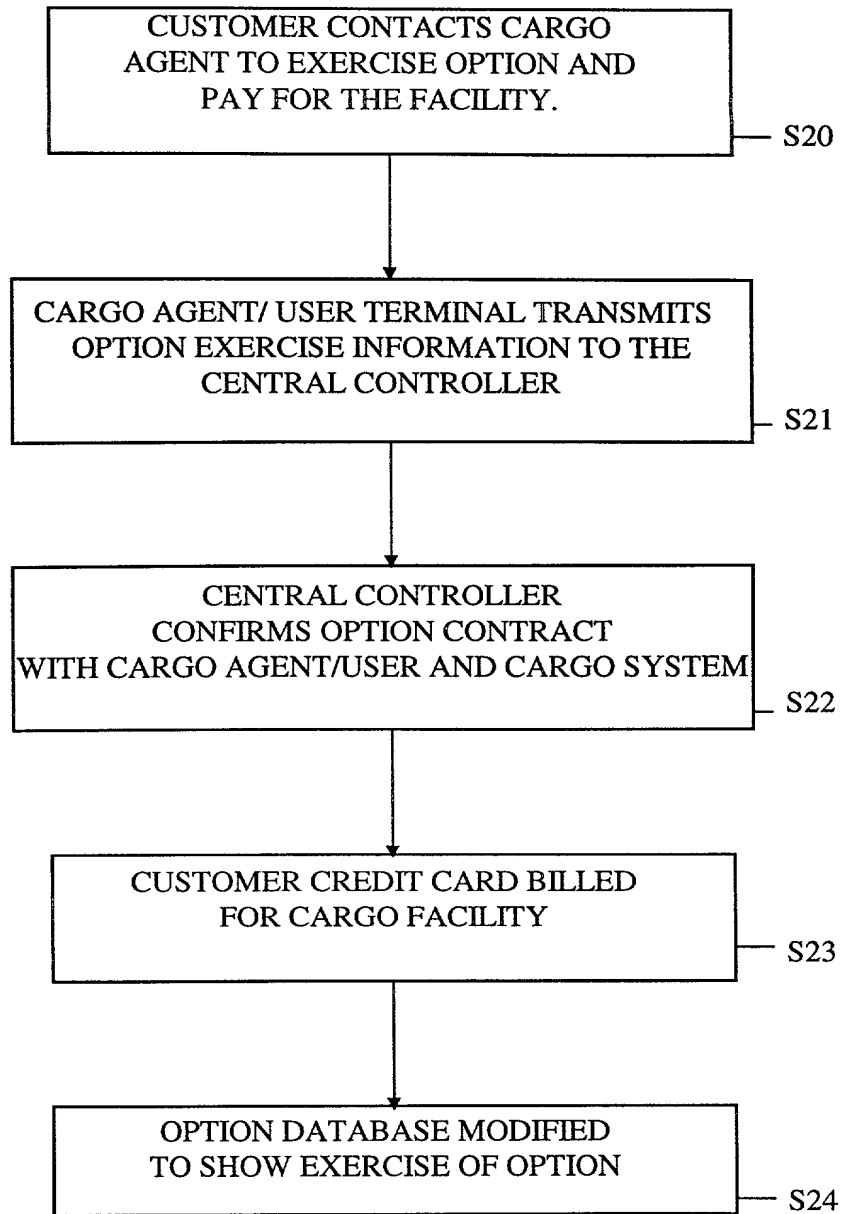


FIG.6

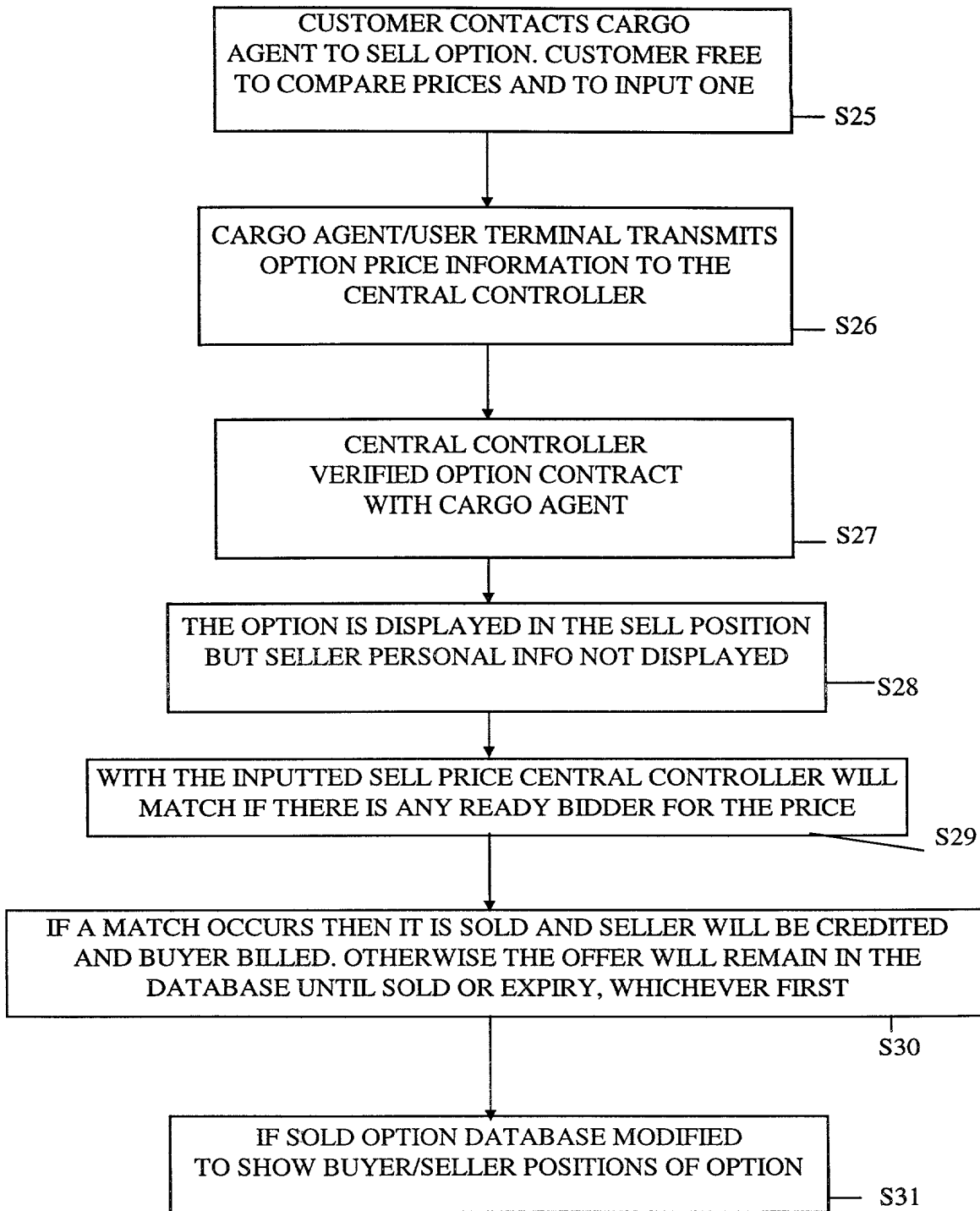


FIG.7

NOTE TO INTERNET USERS, YOU HAVE TO REGISTER FIRST BEFORE USING.

**CLICK HERE TO REGISTER.**

REGISTERED USERS PLEASE SIGNED IN. THIS IS A SECURED WEBSITE.

NAME

PASSWORD

AGAIN TO CONFIRM

BUY

SELL

☐

TICK HERE TO SHOW YOUR PORTFOLIO

PRESS RETURN

**NO PASSWORD IS REQUIRED FOR SERVICES BELOW.**

PLEASE FEEL FREE TO BROWSE OUR SITE. YOUR FEEDBACK IS IMPORTANT TO US.


BROWSE

LIST OF INSTITUTIONS

FEEDBACK

FORGOT YOUR PASSWORD AND USER NAME ? **USE OUR FORM HERE**

**FIG 8**

Please type a plus sign (+) inside this box → 

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<b>DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION</b> <b>(37 CFR 1.63)</b>	<b>Attorney Docket Number</b>	
	<b>First Named Inventor</b>	<u>KHAI HEE KWAN</u>
	<b>COMPLETE IF KNOWN</b>	
	<b>Application Number</b>	<u>/</u>
	<b>Filing Date</b>	
	<b>Group Art Unit</b>	
<input checked="" type="checkbox"/> Declaration Submitted with Initial Filing	OR	<input type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)
	<b>Examiner Name</b>	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method, apparatus and program for pricing, transferring, buying, selling and exercising of freight cargo options on the World wide web

the specification of which

(Title of the Invention)

☒ is attached hereto  
OR

☐ was filed on (MM/DD/YYYY)                      as United States Application Number or PCT International

Application Number                      and was amended on (MM/DD/YYYY)                      (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:


I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

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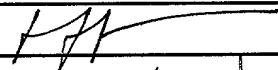
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First inventor: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle (if any))	Family Name or Surname
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☐ Additional inventors are being named on the supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto